



*International Society of Arthroscopy,
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6th BIENNIAL ISAKOS CONGRESS

FLORENCE ITALY

MAY 27-31, 2007



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with Discount: **March 1, 2007**



WINTER 2007

Volume 11, Issue 1

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ISAKOS

newsletter

6th ISAKOS Biennial Congress in Florence!

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Congress Highlights

- Evidence Based Medicine
- Arthroscopic Surgery in 2020
- Double Bundle ACL & PCL
- Minimally Invasive Joint Arthroplasty
- Meniscal Transplant
- Cartilage Technology
- Arthroscopic Rotator Cuff Repair & Instabilities
- Hip Arthroscopy
- Injury Prevention
- Rehabilitation Based on Science
- Sports with Joint Replacement

Featured Sessions

- Live Surgical Demonstrations
- Hands-On Workshops
- Poster Exhibits
- Scientific Paper Presentations
- Instructional Course Lectures
- Technical Exhibits



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Editor's Note

Ronald M. Selby, MD (USA)

ACTIVE, PROACTIVE, AND RESPONSIVE

You and I have every reason to be proud and pleased with **OUR** organization. Leaf through the pages of this edition of the **Newsletter** and you will sense the energy, enthusiasm, and the many activities embraced by ISAKOS. **YOUR** International Society of Arthroscopy, Knee Surgery and Orthopaedic Sports Medicine takes its role seriously as **the** world leader in education, research, and patient care within our

discipline. Look at the directives that have come out of the Global Leadership Retreat in Beijing. The emphasis on education in developing countries speaks to the wisdom, foresight, and compassion of world leaders in our field who understand the impact and role of ISAKOS and the positive influences it has and will have in the world. The impact of ISAKOS is great for humanity and it's great for you and me!

Take note of the committee meetings scheduled for San Diego, California, USA at the American Academy of Orthopaedic Surgeons Annual Meeting. And, of course, preview the many offerings of the Biennial Congress in Florence, Italy! The Biennial Congress is the crown jewel of the educational offerings (and there are many) of ISAKOS. If you, by some chance, are not planning on attending I urge you to reconsider! If you miss it you will most definitely regret it! This meeting will be talked about for years! First, consider the destination – and what a destination! As the capital of Tuscany and the cradle of the Renaissance, Florence has much to offer: art, architecture, sculptures, Italian cuisine, the Palazzo Vecchio, the Duomo and the Uffizi Gallery. Along the banks of the Arno River have walked Dante, Michelangelo, da Vinci, Boccaccio, Giotto, Masaccio, Botticelli, Galileo, Verdi, Puccini and thousands of others who made Florence an undisputed cradle of talent and intellect.

(continued on page 7)



President's Message

John A. Bergfeld, MD (USA)

These are exciting times for ISAKOS. As the world flattens, ISAKOS is uniquely positioned to carry out our mission to *advance the worldwide exchange and dissemination of education, research and patient care in arthroscopy, knee surgery and orthopaedic sports medicine.*

Under the superb leadership of the Committee Chairs, our committees are functioning well and have utilized the world-wide membership and expertise in producing educational material for our members.

These projects will be presented at the upcoming ISAKOS Congress, and include Arthroscopic Anatomy, Patellofemoral Biomechanics, Minimally Invasive Knee Reconstruction, Biceps Tendon, and Sports Injuries of the Elderly.

We have restructured our Membership Committee, assigning co-chairs for each of the geographic areas, i.e. Europe (ESSKA); Latin America/Mexico (SLARD); North America (AANA/AOSSM); and Asia (APOSSM—Asia divided into three major areas as designed by the APOSSM). Finally, co-chairs will be assigned to the unaligned areas of the world such as Africa and the Middle East.

Developing countries have been a high educational priority. We have partnered with ESSKA for 2 East Central European educational programs in St. Petersburg, Russia and Warsaw, Poland. We also partnered on a program with the Chinese Orthopedic Association (COA) and The Chinese Sports Medicine Association (CASM) in Beijing.

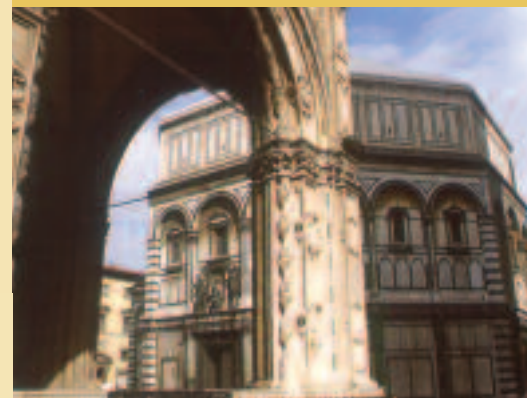
The Executive Committee and strategic invited members met with our major industrial supporters at the second ISAKOS Global Leadership Retreat in Beijing, China this past October. This was a unique opportunity to discuss how industry can significantly support our mission and for ISAKOS to learn about the problems, issues and concerns of industry. As a result of this unique retreat, ISAKOS will be bringing several new ideas to our Strategic Planning Committee.

Our committees have flourished under the strong leadership of the Chairs. Please consider volunteering for a committee of your choice, by advising the Chair of your interest. The Committee on Committees will meet at the AAOS Annual Meeting in San Diego, California on February 13–14, 2007 to finalize committee appointments.

It is a great honor to be entrusted with leading ISAKOS through its adolescence as we celebrate our 12th birthday at our Biennial Congress in Florence, Italy. This Congress promises, under the direction of Program Chair, Lars Engebretsen, to be one of the best meetings we have ever had. Please register and make your lodging reservations today!

6th BIENNIAL ISAKOS CONGRESS

MAY 27–31, 2007



www.isakos.com/register

You can register online for the 2007 ISAKOS Congress. Visit the ISAKOS Web site at www.isakos.com/register, enter your registration information and provide a credit card number for payment. Your payment will be processed immediately and you will receive a confirmation of your registration via e-mail. Registration discounts will be honored until March 1, 2007.

The deadline to pre-register for the 2007 ISAKOS Congress is April 15, 2007. After April 15, you will be required to register on-site at the meeting in Florence, Italy.

If you prefer to submit your registration via fax or mail, you may download the registration form from the ISAKOS Web site at www.isakos.com.

ISAKOS WELCOMES NEW MEMBERS

ASSOCIATE MEMBERS

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 Denis R. Atkinson, FRACS, New Zealand
 Luciano Taylor Auriglietti, MD, Brazil
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 Julio Cesar Gali, MD, Brazil
 Ruben Dario Garcia, MD, Argentina
 Charles J. Gatt, MD, USA
 Ullrich Gebhardt, MD, Germany
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 Marcus Vallada Guimaraes, MD, Brazil
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 J. Allen Hardin, PT, SCS, ATC, USA
 Nigel Gordon Hope, PhD, FRACS, Australia
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ISAKOS COMMITTEES

The ISAKOS Committee on Committees is scheduled to meet during the AAOS Annual Meeting in San Diego, CA to determine the appointments of Chairs, Deputy Chairs and Members of the ISAKOS Committees for the 2007–2009 term. All Chairs and Deputy Chairs are requested to assist the Committee on Committees in providing input on the members of your committee. The committees are essential to ISAKOS and the growth of our Society.

The committee appointments for the 2007–2009 term will be finalized at the AAOS Annual Meeting and will be announced immediately following. **The new committees will meet during the ISAKOS Congress in Florence, Italy.**

Please forward your list of committee members to the ISAKOS Office at 2678 Bishop Dr, Suite 250, San Ramon, CA 94583 or email to: Elizabeth@isakos.com **no later than February 1st.**

All of the ISAKOS 2007–2009 Committees will meet at the upcoming 6th Biennial ISAKOS Congress in Florence, Italy. The committee schedule is listed on page 5.

If you are asked to participate on a committee, you will be expected to attend committee meetings at the:

1. 2007 ISAKOS Biennial Congress in Florence, Italy (May 27–31, 2007)
2. 2008 AAOS Annual Meeting in San Francisco, CA (March 5–9, 2008),
3. 2009 AAOS Annual Meeting in Las Vegas, NV (February 25–March 1, 2009); and the
4. 2009 ISAKOS Biennial Congress in Osaka, Japan (April 5–9, 2009).

Attendance at all meetings is not mandatory, but the Board would like members to make every effort to attend. Please be advised that ISAKOS is unable to reimburse committee members for any expenses associated with travel to ISAKOS committee meetings or ISAKOS congresses.

In addition, all old and new committee members will attend the Strategic Planning Forum on Saturday, May 26 from 12:00 pm – 4:00 pm. All new and old committee members will attend this important session to discuss the future of ISAKOS. This meeting is at the Fortezza da Basso in Florence, Italy.

PAY YOUR ISAKOS MEMBERSHIP DUES TODAY!

Please visit www.isakos.com and log into the Member's Only Section to pay your membership dues online or download your invoice. Your membership dues must be paid in full to receive the member registration fee for the 2007 ISAKOS Congress.

Your ISAKOS Membership includes:

- Automatic subscription to the official ISAKOS Journal *Arthroscopy: The Journal of Arthroscopic and Related Surgery*
- Optional online subscription to *Knee Surgery, Sports Traumatology, Arthroscopy* (KSSTA)—the official journal of the European Society of Sports Traumatology, Knee Surgery and Arthroscopy (ESSKA)
- ISAKOS Biannual Newsletter
- Discounted registration rate at the ISAKOS Congress
- Access to "Member's Only" at www.isakos.com
- Opportunity to participate in ISAKOS Approved Teaching Centers and Approved Courses
- Complimentary publications from ISAKOS Committee Projects

NEW! Go directly to the *Arthroscopy: The Journal of Arthroscopic and Related Surgery* through the **Members Only Section** on www.isakos.com.

ISAKOS OFFICE STAFF UPDATE

The ISAKOS Office would like to congratulate Gigi Tarasow on the birth of her son, Max and Rebecca Etherington-Smith on the birth of her son, Luca. We wish them both the best in their new roles!

ISAKOS welcomes two new staff members to its team: Katie Anderson who graduated from St. Mary's College of California in Moraga with a Bachelor of Arts degree in English & Communication and Elizabeth Collins-Gibson who graduated with a Bachelor of Science degree with a concentration in Non-Profit Organizations from Louisiana State University.

ISAKOS OFFICE

Michele Johnson, *Executive Director*
Elizabeth Collins-Gibson, *Project Manager*
Katie Anderson, *Project Manager*

ISAKOS COMMITTEE MEETINGS

AAOS ANNUAL MEETING DATES: FEBRUARY 12–14, 2007
Omni Hotel, San Diego, California

Monday, February 12	Time	Gaslamp 1			
	12:00 PM–6:00 PM	Executive Board Meeting and Finance Committee Meeting			
Tuesday, February 13	Time	Gaslamp 1	Gaslamp 2	Gaslamp 3	Gaslamp 4
	8:00 AM–10:00 AM	Education Resource Development (2 hr)		Membership (2 hr)	8:00 – 11:00 am Orthopaedic Sports Medicine Committee Current Concepts: Sports and Activity in the Elderly (by invitation)
	10:15 AM–11:15 AM	Communications (1 hr)	Scientific (2 hr)		
	11:15 AM–12:15 PM	Newsletter Editorial (1 hr)			11:00 – 12:00 pm Committee Meeting to follow Current Concepts Meeting
	1:30 PM–3:30 PM		Strategic Planning (2 hr)	Knee (2 hr)	
	3:30 PM–5:30 PM	Upper Extremity (2 hr)	Committee on Committees (2 hr)		
Wednesday, February 14	Time	Gaslamp 1		Gaslamp 2	
	8:00 AM–10:00 AM	Journal Advisory Task Force (2 hr)		Education (2 hr)	
	10:15 AM–12:15 PM	Program (2 hr)		Arthroscopy (2 hr)	
	12:30 PM–2:30 PM	Board of Directors Only			
	2:30 PM–5:30 PM	Board of Directors and All Committee Chairs from the 2005–2007 and 2007–2009 terms			

ISAKOS CONGRESS: MAY 27–31, 2007
Fortezza da Basso, Florence, Italy

Friday, May 25	Time	2005–2007 Committee
	2:00 PM–5:00 PM	Executive Committee & Finance
Saturday, May 26	Time	2007–2009 Committee
	7:00 AM–8:30 AM	2005–2007 Program Committee
	7:00 AM–8:30 AM	Membership
	7:00 AM–8:30 AM	Arthroscopy
	8:30 AM–10:00 AM	Newsletter Editorial Board
	8:30 AM–10:00 AM	Education
	10:30 AM–12:00 PM	Upper Extremity
	10:30 AM–12:00 PM	Scientific
	10:30 AM–12:00 PM	Communications
	12:00 PM–4:00 PM	ISAKOS Strategic Planning Forum (all NEW AND OLD committee chairs and members to attend) with lunch
Sunday, May 27	Time	2007–2009 Committee
	7:00 AM–9:00 AM	Orthopaedic Sports Medicine
	7:00 AM–9:00 AM	Journal Advisory Task Force
Thursday, May 31	Time	2007–2009 Committee
	9:00 AM–10:30 AM	New Program Committee
	10:30 AM–12:00 PM	2007–2009 Board of Directors 2007–2009 Committee Chairs

ISAKOS GLOBAL LEADERSHIP RETREAT

Global *Leadership* Retreat

October 26–27, 2006 | Beijing, China

In October, ISAKOS Leadership and corporate campaign donors met in Beijing, China for the second ISAKOS Global Leadership Retreat.

The Global Leadership Retreat was designed to create dialogue between industry and ISAKOS to address problems, issues and concerns facing both industry and ISAKOS, as well as develop action items for ISAKOS and industry to carry out solutions to the problems, issues and concerns identified. Topics discussed included education, research, membership and administration.

The outcome of this forum was the development of a plan to achieve the ISAKOS vision of advancing our specialties around the world, to continually sponsor effective programs and to advance cooperation among ISAKOS and industry leaders.

ISAKOS appreciates the participation of its industry partners at the Global Leadership Retreat. Their continued support allows ISAKOS to fulfill its mission.

Thanks to the companies that participated
in the Global Leadership Retreat



ISAKOS PATELLOFEMORAL TRAVELING FELLOWSHIP

Sponsored by the Patellofemoral Foundation, Inc.

The ISAKOS Patellofemoral Traveling Fellowship was established to promote better understanding and communication regarding patellofemoral pain. The fellowship is awarded on a competitive basis to an orthopaedic surgeon interested in the study and advancement of understanding of the patellofemoral joint.

Dr. Ryosuke Kuroda was awarded the fellowship for 2006. He traveled with Dr. Philippe Neyret and Dr. Peter Verdonk in Lyon where they discussed topics including Patellofemoral Disorders, Fulkerson Osteotomy and the Fithian MPFL technique.

Now Available...

NEW ONLINE PROSPECTIVE MULTI-CENTER SURVEY OF THE MEDIAL COLLATERAL LIGAMENT (MCL) OF THE KNEE

The ISAKOS Orthopaedic Sports Medicine Committee has developed a worldwide survey of ISAKOS members concerning the treatment of acute isolated tears of the Medial Collateral Ligament (MCL) of the knee. As there is presently no gold standard for treatment of isolated MCL injuries, the purpose of the survey is to establish an up to date overview of treatment options in current usage globally for this injury.

The aim of this study is to include as many patients as possible who are under the control, directly or indirectly, of an ISAKOS member. A 3 month period will be chosen by each participant according to the sports program that they are involved in (e.g. after the beginning of the season, training, games, etc.). The treating physician is to use his/her usual treatment protocols for managing the injuries during the course of the study.

Please go to www.isakos.com to enter your data for the diagnosis, treatment and follow up of isolated MCL injuries.

Data will be collated at the completion of the survey and the results presented at a future ISAKOS meeting.

Francois Kelberine, MD

Peter Myers, MD

ISAKOS Orthopaedic Sports Medicine Committee 2005–2007

FROM OUR LEADERSHIP

continued from page 2

Editor's Note

And to that, all of the education, camaraderie, stimulation, and excitement of the ISAKOS Biennial Congress where thought leaders from around the world in our field gather offering an international perspective with fresh ideas and solutions to problems that we face every day in our practices and in the operating room! We expect over 2,500 orthopaedic surgeons to attend the Congress from our areas of orthopaedics – arthroscopy, knee surgery and orthopaedic sports medicine. It's an incomparable combination!

Read about the fabulous educational agenda **President John Bergfeld** and the Program Committee, under the leadership of **Program Chair Lars Engebretsen**, have put together. The 6th Biennial ISAKOS Congress will be memorable! Mark your calendars now for May 27th–31st, 2007 and make your travel and hotel reservations for Florence, Italy today! I'll see you there!

Ciao!

Ronald M. Selby, MD

ISAKOS

DOUBLE BUNDLE ACL RECONSTRUCTION Using Only the Semitendinosus



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Due to recent studies suggesting the need for better rotational control than that provided by the conventional ACL reconstruction (ACLR) techniques currently used, renewed interest at the anatomic double bundle ACLR have prompted the orthopaedic community to take a second-look at the technique and its possible implications. Foremost among the concerns associated with the double bundle procedure is the technical expertise required to perform the technique properly. Moreover, surgeons have to contend or at least be wary of the reported incidence of hamstring weakness when using both the semitendinosus and gracilis tendons for this type of reconstruction. But basically, surgeons contemplating the use of a double bundle technique have to answer the same question: Is double bundle ACLR better than conventional reconstruction techniques available? At present, the answer may be more complicated than one would expect.

INTRODUCTION

Anatomical studies have demonstrated that the anterior cruciate ligament is composed of two functional bundles anteromedial (AM) and posterolateral (PL). The nomenclature of these two bundles is related to their insertion in the tibial plateau. On the femoral side, these bundles have been demonstrated to lie on different coronal planes with the AM bundle originating more proximally than the PL bundle. Biomechanically during knee flexion, the AM bundle has been observed to tighten while the PL bundle slackens. On the contrary, during knee extension the PL bundle tightens while the AM bundle loosens.

The majority of the reconstruction techniques basically reconstruct the anteromedial bundle of the cruciates as the femoral tunnel is placed between the 10 and 11 o'clock position for the right knee (or 1 and 2 o'clock position for the left knee). While good results have been generally demonstrated concurrent with its ability to restore the knee's AP stability, questions remain regarding its efficiency in restoring rotatory stability. Recently, the performance of an anatomic double bundle reconstruction technique has generated renewed interests as several in vitro analysis demonstrated better results in terms of restoring knee rotational stability.

Performing an anatomic double bundle reconstruction usually entails the use of both the semitendinosus (ST) and Gracilis (G) autografts requiring the use of independent femoral and tibial fixations. With this technique therefore, the surgery becomes more costly with the additional fixation required.

Moreover, with the use of both the STG, hamstring strength deficits in deep flexion and internal rotation can be a possible complication as have been demonstrated by previous studies.

In the following technical note, we illustrate a modification of the anatomic double bundle technique using a single semitendinosus autograft with independent femoral but single tibial fixation system. This double bundle single tendon (DBST) technique enables the surgeon to achieve an anatomic reconstruction without compromising the hamstring function while at the same time avoids the use of additional fixations limiting the cost of the surgery.

SURGICAL TECHNIQUE

Following the administration of anesthesia, the patient is positioned supine on the operating table. A tourniquet is placed at the proximal aspect of the thigh with sufficient distance from the expected exit point of the beath needle in the thigh's lateral aspect. A lateral post for thigh support and a foot bar are then placed to enable the knee to be positioned at 90° flexion on the table during surgery. This set-up also allows sufficient provision for full range of motion.

Once standard prepping and draping are completed, the tourniquet is inflated to 300 mmHg. A 3 cm vertical incision is then made centered approximately 5 cm below the medial joint line, midway between the tibial tubercle (Gerdy's tubercle) and the posteromedial aspect of the tibia. The sartorial fascia is incised and the semitendinosus tendon is dissected. The tendon is completely detached from its proximal attachment with an open tendon stripper. On its tibial end, the tendon's length is maximized preserving as much length as possible by detaching the ST close to the bone. Ideally, a length of > 28 cm. is desired.

At the back table, while the surgeon prepares the tunnels, the surgical assistant proceeds with the preparation of the double bundle graft. Once the graft is cleaned and devoid of excess tissues, measurement of the tendon follows. The minimum length needed is 28 cm. to allow the possibility of cutting the graft in half with sufficient length to fold each half of the graft to a length of 7 cm. In such way, we can have 2 cm. graft length for the femoral and tibial tunnels and 3 cm. intra-articularly. The ends of the grafts are then whipstitched using Ticon 5 sutures. The appropriate sizes of the EndoButton® CL (Smith & Nephew Endoscopy, Andover, Massachusetts) as determined by the AM and PL tunnel lengths are then attached at the end of each graft. The diameter of each bundle is then measured using 0.5 mm increment sizers to match with the size of the femoral and tibial tunnels. Pretensioning and preconditioning of the grafts with cyclic flexion and extension of the knee under maximum manual tension follows.

Using standard anterolateral and anteromedial portals, the knee joint is visualized and prepared for tunnel placements. The anatomic footprints of the native ACL on both the femoral and tibial sides are identified. The PL femoral tunnel is initially prepared using an "outside-in" technique. To properly achieve this step, a customized Posterolateral (PL) tunnel guide is used (Shino K. Japan). This customized guide has a component arm designed to reach either the 9 o'clock or the 3 o'clock position. The arm of the PL guide is inserted in the antero-lateral portal and positioned at either 9 o'clock or 3 o'clock on the medial wall of the lateral condyle while the handle is maneuvered at the area of the junction of the distal femur and lateral condyle to fix the entry point for the tunnel. A guide wire is inserted from outside which is followed by a 4.5 mm cannulated drill to prepare the pilot hole. Once the length of this hole is measured, a 6 mm PL tunnel with its appropriate depth is drilled. Preparation of the 7 mm AM tunnel follows, using standard techniques with the tunnel placed at the either the 11 o'clock or 1 o'clock position. At the end of this step, we have two divergent tunnels positioned anatomically.

The tibial tunnels are prepared at an angle of 45° with the entry point separated by a distance of 1–1.5 cms. These tunnels converge on the ACL's footprint intraarticularly.

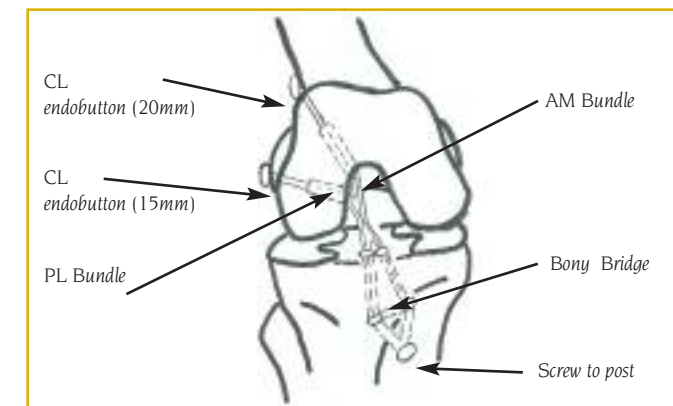


Figure 1: The PL bundle demonstrated here with the attached endobutton CL is initially inserted. The AM bundle is then inserted. Both bundles are checked if they are properly anchored against the cortical surface of the femur.

With the tunnels ready, the PL bundle is positioned first followed by the AM bundle. Once in place, the femoral fixation is double checked to determine if the endobuttons are securely anchored against the cortex (Fig 1).

On the other hand, the tibial end of the graft is fixed using a single screw-post construct with the AM bundle secured at 40°– 60° of flexion and the PL bundle fixed at full extension.

The graft is then checked for impingement and the knee examined for range of motion and stability with the lachman's test. The graft's position is confirmed with the post-op radiograms (Fig 2a & 2b). Postoperatively, a standard rehabilitation regimen is commenced.

DISCUSSION

The anterior cruciate ligament (ACL) plays a crucial role in maintaining the anteroposterior and rotational stability of the knee joint. Because of recent investigations indicating that conventional ACL reconstruction procedures only provide sufficient AP and inadequate rotational stability, renewed interest on the performance of an anatomic reconstruction technique has been generated. Biomechanical and in vitro investigations reveal that anatomical reconstruction can result to an anterior tibial translation that is significantly closer to that of an intact knee and produces better rotatory stability than conventional single bundle ACL procedures. These findings are consistent with the results of Tashman et al which demonstrated that single bundle reconstruction sufficiently restores AP tibial translation but fails to provide rotational stability during dynamic loading.

The DBST (double bundle, single tendon) technique described here offers the possibility of reconstructing both the AM and PL bundles without sacrificing the functional integrity of the hamstring muscles by preserving the gracilis avoiding deep flexion and internal rotation strength deficit and preserving an active protection for further ACL injuries. Furthermore, the single fixation system at the tibial side achieves adequate fixation at the prescribed flexion angles for each bundle with less cost for the patient.

The authors recognize that the performance of an anatomic double bundle reconstruction is technically demanding and entails an additional cost for the surgery. Therefore, it is recommended that surgeons carefully select the patients for this procedure.

CONCLUSIONS

The DBST technique enables an anatomic reconstruction which preserves the gracilis minimizing the hamstring strength deficits. The single tibial fixation system offers a stable fixation achieved the prescribed angle demanded by each bundle. Further biomechanical and clinical investigations are necessary to validate the outcome for this technique.

Full article and references also available online at www.isakos.com

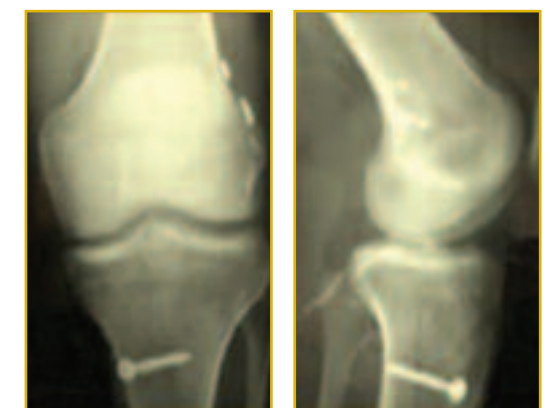


Figure 2 a & 2 b: Immediate post op. Xray showing the tunnels, femoral and tibial graft fixation

CURRENT CONCEPTS OF REHABILITATION

Following ACL Reconstruction

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Although rehabilitation following ACL reconstruction is thought to be very important by almost all surgeons, very little discussion concerning this matter is included in most papers published on ACL reconstructions and their follow-ups. In fact, the majority of papers simply state that a modified accelerated or aggressive rehabilitation protocol is followed, with vague details concerning the rehabilitation protocol. Very few authors document their patients' compliance with the protocols. A statement indicating the time when patients are advised to go back to unrestricted work or athletic activities is often provided, but almost no one documents the actual time that their patients do go back successfully to full activities and at what level of participation. From the material provided in the literature, very little information can be obtained about what constitutes a safe and effective rehabilitation program. There are, however, a number of articles published in the recent past which use study designs (randomized clinical trials—RCTs) which allow the reader to glean some meaningful information about the safety and efficacy of rehabilitation programs. The purpose of this brief article is to provide a summary of the information obtained from such publications which can be used to help construct an appropriate rehabilitation protocol, as well as to identify important aspects of rehabilitation where our present knowledge is wanting.

IMMEDIATE VERSUS DELAYED MOTION

Five RCTs comparing delayed versus immediate motion after ACL reconstruction have shown that the ill affects of immobilization can be minimized without compromising the integrity of the healing graft during rehabilitation following ACL reconstruction. Early mobilization prevents problems with motion loss often seen after prolonged avoidance of movement. It was also found to reduce pain and avoid adverse changes within the articular cartilage. There is little evidence that immediate motion after ACL reconstruction coupled with meniscal repair is associated with poorer outcomes, although no RCTs document this.

IMMEDIATE VERSUS DELAYED WEIGHTBEARING

Prospective RCTs comparing immediate versus delayed weightbearing performed by Jorgensen et al and Tyler revealed no significant difference in clinical, patient and functional outcomes, indicating no evidence of permanent elongation of the graft or disruption of the initial fixation. However, the effect of early weightbearing on the healing of articular cartilage damaged at the time of the ACL injury or meniscus repair is unknown.

OPEN VERSUS CLOSED KINETIC CHAIN EXERCISES

Open kinetic chain (OKC) versus closed kinetic chain (CKC) exercises following ACL reconstruction have been evaluated in four RCTs. Only one of these studies, all of which involved bone-patellar tendon-bone autografts, revealed any difference in the anterior laxity at the time of follow-up (one year or less). Bynam's group showed increased anterior laxity and poorer patient satisfaction at one year postoperatively, whereas the other studies revealed no adverse effects on anterior laxity when OKC exercises were utilized. There were several differences in the timing and dosage of the treatments used and the determination of A-P laxity, which makes the results of these investigations difficult to compare. Thus, there appears to be no consensus about the effects of OKC knee extensor exercises during the early phases of healing following ACL reconstruction in spite of the potential disadvantages of early use of OKC exercises.

REHABILITATION BRACES

Four RCTs have demonstrated that the use of rehabilitation braces in the early postoperative period following an ACL reconstruction results in less swelling, pain and wound drainage than when these braces were not used. However, at final follow-up (range 1–2 years), no differences were found with regard to knee range of motion, subjective satisfaction, A-P laxity, activity level, muscle strength or ability to perform one-legged hop tests whether a rehabilitation brace was used or not.

FUNCTIONAL KNEE BRACES

Two RCTs evaluating the efficacy of functional knee bracing following ACL reconstruction for a minimum of two years revealed no perceptible advantage in the use of these braces. In both studies, no differences in A-P laxity, functional testing, patient satisfaction, range of motion or strength were found between the group treated with a functional brace compared to the group that did not use functional bracing.

HOME VERSUS CLINIC BASED REHABILITATION PROGRAMS

Beard and Dodd, Fischer et al, Grant et al, and Schenck et al have performed RCTs comparing home versus clinic-based rehabilitation. Although different amounts of supervision were provided in these studies, they showed that home-based rehabilitation was as effective as clinic-based programs even though the latter groups had greater supervision.

NEUROMUSCULAR ELECTRICAL STIMULATION VERSUS VOLUNTARY MUSCLE CONTRACTION

In two RCTs, Snyder-Mackler and colleagues found that rehabilitation incorporating combined volitional exercises and neuromuscular electrical stimulation resulted in a more normal gait pattern and stronger quadriceps compared to rehabilitation that only included volitional exercises. In one of the studies, no differences in A-P laxity between the two treatment groups were found at the time of follow-up.

SPECIFIC EXERCISE PROGRAMS

In an RCT comparing isotonic strength training versus proprioceptive training applied after six months of rehabilitation following an ACL reconstruction with hamstring grafts, Liu-Ambrose et al found similar improvements in function and patient-oriented outcomes at 9 months following ACL reconstruction. However, a greater increase in isokinetic strength was experienced by the group which did the proprioceptive training. In a similar RCT beginning between 4 and 14 weeks postoperatively, Cooper et al observed somewhat different results because there was no advantage to proprioceptive training compared to the strengthening exercises alone.

Blanpied et al used an RCT to evaluate the addition of lateral slide exercises to a home-based aggressive program and found greater knee extension strength in the lateral slide group at the 8- and 12-week follow-up visits without evidence of increased A-P laxity.

Beginning at four weeks after ACL reconstruction, Meyers et al used an RCT to show that when eight weeks of training with either stair-climbing or cycling was added to an otherwise similar rehabilitation protocol, no differences in isokinetic strength resulted.

Hehl and colleagues randomized patients being rehabilitated following ACL reconstruction into one group that received isokinetic strength training or another that did not during the sixth to the ninth postoperative weeks. The isokinetic group developed greater muscle strength without suffering any increase in joint laxity at 6 months following surgery.

DURATION OF REHABILITATION

In the majority of articles the time interval that patients have been allowed to return to unrestricted athletic activities is six months or more in spite of the assumption that the duration of rehabilitation has diminished significantly in recent years. In a survey of members of the ACL Study Group presented in April, 2006, Brown (personal communication) reported that the majority of 88 respondents (71%) did not allow their athletes to return to "unrestricted cutting sports" until 6 months or more following ACL reconstruction. However, 5 respondents (5.5%) stated that they allowed a return to such sports at 3 months or even less.

It is probable that there is a wide variation in the time following ACL reconstruction that patients are ready or even want to return to sports, the degree to which they perform suggested rehabilitation protocols, and even the responses of the knee to the initial ACL injury and the ensuing surgical intervention. Thus, there is really be no fixed time that patients can and do return to sports. Shelbourne, who has published extensively on the subject of rehabilitation following ACL reconstruction is an enthusiastic advocate of accelerated rehabilitation. He is, however, often misquoted when the time of return to full activity is presented by others. In his 1995 study he allowed his patients to return to "sports specific" activities at a mean of 6.2 weeks following the surgery, but his patients did not return to full athletic competition until a mean of 6.2 months after the surgery.

Ekstrand⁹ compared a 6 month to 8 month rehabilitation program and found a trend for patients in the extended group to have more normal A-P laxity values at 1 year follow-up. In contrast, in an RCT done by Beynon et al comparing a 19 week to 32 week protocol no differences were found at two years in any outcome parameters evaluated (clinical, patient-oriented and functional outcomes as well as alterations in synovial fluid based markers of articular cartilage metabolism).

No RCT has demonstrated that routine return to full activities before six months is safe. The time interval between the ACL reconstruction and the return to full activities cannot be used as the only criterion for determining when return is safe and efficacious. Return to sports should not occur until the knee is painless, has no effusion, a full range of motion, and the patient has adequately rehabilitated muscles, restored agility and confidence in the knee. There is an unknown and variable interval after surgery during which the healing and remodeling ACL graft is vulnerable to injury if unrestricted activities are allowed too soon. Thus, there is little evidence that an ever-decreasing time to return to full activities will not eventually produce harm to the graft. Surgeons would be wise to avoid overzealous compliance with the athlete's desire to return to sport too soon. The exact timing of full return must be based on each individual's performance and avoidance of placing high stresses on the joint before healing and remodeling are well-advanced. We do not presently have enough information to prescribe a single aggressive protocol for everyone. It is the surgeon's responsibility to carefully monitor each patient's progress through their rehabilitation and avoid allowing unprepared patients to return to sports too soon.

Full article and references also available online at www.isakos.com

LEARNING ARTHROSCOPIC ROTATOR CUFF Repair Does Not Compromise Patient



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OUTCOME: A CONCISE FOLLOW-UP REPORT.

ABSTRACT:

Purpose: Arthroscopic rotator cuff (RC) repair is reported to have a steep learning curve with rapid decrease in rotator cuff repair time (RCRT) during a surgeon's first 10 cases. Faster surgery may represent learning; however, faster surgery does not represent better surgery. The purpose of this study is to evaluate clinical outcome (rather than RCRT) during the learning phase of arthroscopic RC repair.

Methods: 100 consecutive patients having arthroscopic rotator cuff repair performed by a single surgeon beginning with his first case in private practice described their shoulder self-assessment numerical evaluation (SANE rating) after follow-up of no less than 24 months. Mean SANE ratings for consecutive blocks of ten cases were compared. SANE rating was also analyzed by constructing a best fit linear equation ($y = mx + b$) where m , the slope of the line, illustrates rate of increase in SANE rating as experience is gained (learning).

Results: There were no significant changes in mean SANE rating when comparing consecutive blocks of ten cases ($p = 0.1887$). m , or learning, (rate of increase in SANE rating) equals 0.026.

Discussion: Our results demonstrate that in contrast to RCRT, patient outcome is not compromised during the initial phase of learning arthroscopic RC repair. Learning (improved patient outcome) was observed throughout the study, but statistically significant changes in mean SANE rating were not observed. This finding is corroborated by quantitation of the rate of learning; m of only 0.026 demonstrates that the rate of improvement in outcome with increasing experience is small.

Clinical Relevance: So long as a surgeon is willing to spend the additional time required to complete arthroscopic RC repair during his or her initial cases, patient outcome need not be compromised. This may be reassuring to surgeons contemplating making the transition to arthroscopic rotator cuff repair.

Key Words: Learning; arthroscopic; rotator cuff; repair; outcome.

INTRODUCTION:

With regard to arthroscopic rotator cuff (RC) repair, "Faster surgery does not represent better surgery." Yet, could the opposite also be true? Is it possible that slower surgery might represent worse surgery, specifically surgery resulting in compromised patient outcomes? There is support for this view.

Among the wit and wisdom of surgical aphorisms, it is said, "There are three kinds of surgeons: good fast surgeons, bad fast surgeons, and bad slow surgeons." This suggests that there are no examples of the forth permutation: a good, slow surgeon. Is this wisdom or is this wit? The purpose of this manuscript is to answer this question.

More specifically, our purpose is to determine whether patient outcome is compromised during the learning phase of arthroscopic RC repair, a phase during which operative time, quantitated as rotator cuff repair time (RCRT), takes longer. Our hypothesis is that learning arthroscopic RC repair will not compromise patient outcome.

Arthroscopic rotator cuff repair is demonstrated to have a steep learning curve. Guttman et al. measured RCRT in 100 consecutive patients having arthroscopic rotator cuff repair performed by a single surgeon beginning with his first case in private practice and concluded that mean RCRT decreased significantly from the first block of ten cases to the second block of ten cases. While learning continued throughout the remainder of the cases, the changes in mean RCRT when comparing other consecutive blocks of ten cases was not statistically significant. The initial phase of learning (as graphically represented by the slope of the learning curve) was steep but rapid (Figure 1).

However, as above, a limitation of Guttman's investigation is that "Faster surgery may represent learning; however, faster surgery does not represent better surgery." This concise follow-up report addresses the limitation of the original manuscript by evaluating clinical outcome (rather than RCRT) in the original cohort of patients.

METHODS:

The Methods of Guttman et al. have been reported previously and in detail. After follow-up of no less than 24 months, the original cohort of 100 patients were telephoned by an orthopaedic technologist with no knowledge of the purpose or hypothesis of this investigation and asked to describe their shoulder self-assessment numerical evaluation (SANE rating) where 100 represents a normal shoulder and 0 represents the worst possible shoulder.

LEGENDS:

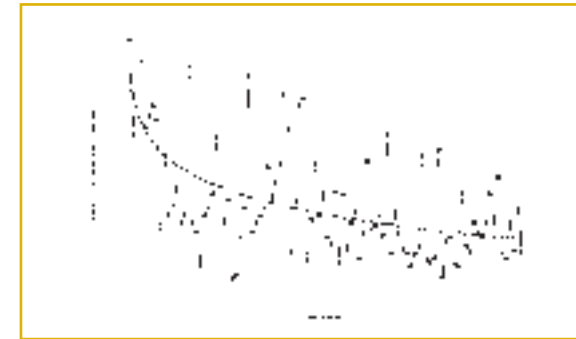


Figure 1: Rotator cuff repair time (in minutes) by case number. The line represents the logarithmic best-fit trend curve.



Figure 2: Mean SANE rating by case number. The line represents the logarithmic best-fit trend curve.



Figure 3: Mean SANE rating by case number. The line represents the linear best-fit trend curve.

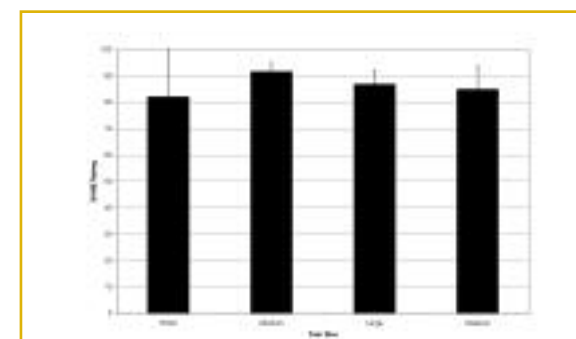


Figure 4: Mean SANE rating by tear size.

Statistical Methods: Statistical analyses were performed using SAS version 9.1.3 (SAS Institute, Cary, NC), and Figures were created using Excel (Microsoft, Redmond, WA). Descriptive statistics were calculated for the demographic variables of age, gender, and tear size (small, medium, large, massive). Consecutive blocks of ten cases were analyzed for mean SANE rating. Mean SANE ratings were compared using analysis of variance (ANOVA) as were the effects of age, gender, and tear size on SANE rating. P values less than or equal to 0.05 were considered statistically significant. SANE rating was also analyzed by constructing a logarithmic trend curve as well as a best fit linear equation ($y = mx + b$) where x represents case number, y represents SANE rating, and m represents the slope of the line. m , the slope, illustrates the rate of increase in SANE rating as experience is gained (learning).

RESULTS:

At mean follow-up of 50.4 months (range 41-65), 82 patients were located for follow-up (transfer bias = 18%). Mean patient age was 57 years (range 33 to 85 years). There were 54 male and 28 female subjects. There were 5 small tears, 33 medium tears, 26 large tears, and 18 massive tears. Demographic variables, SANE rating, and transfer bias by block number are summarized in Table 1.

Mean SANE rating by case number is illustrated in Figure 2. There were no significant changes in mean SANE rating when comparing the consecutive blocks of ten cases ($p = 0.1887$).

Mean SANE by case number is again illustrated in Figure 3. In this Figure, a best fit linear (as opposed to logarithmic) trend line is applied. The slope (m) of the line equals 0.026 which represents the rate of increase in SANE rating (learning).

In sum, 26% of patients (21/82) reported a SANE rating of 100, 58% of patients (48/82) reported a SANE rating between 80 and 99, and 16% of patients (13/82) reported a SANE rating less than 80 (Table 2).

There is no significant difference in mean SANE rating when cases are stratified by age ($p = 0.2046$). There is no significant difference in mean SANE rating when cases are stratified by gender ($p = 0.1381$). There is no significant difference in mean SANE rating when cases are stratified by tear size ($p = 0.2220$, Figure 4).

LEARNING ARTHROSCOPIC ROTATOR CUFF Repair Does Not Compromise Patient *(cont.)*

DISCUSSION:

The purpose of this study is to determine whether patient outcome is compromised during the learning phase of arthroscopic RC repair, a phase during which RCRT takes longer. Our results demonstrate that in contrast to RCRT (Figure 1), patient outcome (SANE rating) is not compromised during the initial phase of learning (Figures 2). Learning (improved patient outcome) was observed throughout the study. However, statistically significant changes in mean SANE rating were not observed when comparing consecutive blocks of ten cases.

This finding is corroborated by evaluation of rate of increase in SANE rating (learning) as quantitatively represented by the slope (m) of the best fit linear trend line derived when mean SANE is graphically analyzed by case number (Figure 3). In this study, the rate of learning was 0.026 (small rate of improvement in outcome with experience). In comparison, the rate of decrease in RCRT (absolute value of m) reported in the initial investigation was 8.75 for the first 10 cases (large rate of improvement in RCRT with experience) and 0.23 for the subsequent 90 cases (moderate rate of improvement in RCRT with experience).

In sum, we interpret these results to indicate that so long as a surgeon is willing to spend the additional time required to complete arthroscopic RC repair during his or her initial cases, patient outcome need not be compromised. This may be reassuring to surgeons contemplating making the transition to arthroscopic rotator cuff repair. In addition, we demonstrate that the rate of increase in SANE rating (learning), while quantitatively small (0.026), is finite. This may also be assuring to surgeons contemplating a career in arthroscopy, because such surgeons may be satisfied to know that with surgical experience, continuous improvement in their patient outcomes may be expected.

We also follow-up on a discussion with regard to tear size. We demonstrate that there is no significant difference in mean SANE rating when cases are stratified by tear size (Figure 4). This is consistent with our initial finding that there is no significant difference in mean RCRT when cases are stratified by tear size.

Limitations of this investigation have been reported previously and in detail. An additional limitation of this investigation is that evaluation of twenty-four month clinical outcome data was not part of the Methods of the original study, (and rather was requested by Arthroscopy journal in review of the original manuscript). Thus, while the original investigation was prospective, the current investigation is retrospective. Pre-operative SANE ratings are not evaluated. We are unable to report change in SANE ratings by case number. Such a report could yield different results. In addition, SANE is a single, patient reported outcome measure; while valid, other or additional outcome measures could yield different results. An additional limitation is that other factors, in addition to increasing arthroscopic experience, could effect outcome. For example, a surgeon's patient selection criteria could change over time. This, too, represents learning, but nevertheless, represents a limitation. In addition, our study is limited by transfer bias of 18%. The outcomes in the patients lost to follow-up, by definition, are unable to be determined; transfer bias of less than 20%, while undesirable, is accepted for twenty-four month follow-up evaluations. Finally, our sub-group analyses (of age, gender, and tear size) must be interpreted with caution; the limited number of study subjects results in a possibility of beta-error, and subgroup analysis was not our primary purpose.

CONCLUSION

Our data supports the hypothesis: learning arthroscopic RC repair did not compromise patient outcome.

Demographic Variables, SANE Rating, and Transfer Bias by Block Number										
	Block 1 (N = 10)	Block 2 (N = 10)	Block 3 (N = 7)	Block 4 (N = 7)	Block 5 (N = 5)	Block 6 (N = 6)	Block 7 (N = 8)	Block 8 (N = 10)	Block 9 (N = 9)	Block 10 (N = 10)
Age Mean (SD)	58.2 (7.2)	55.9 (11.1)	59.7 (6.9)	57.9 (10.6)	55.4 (11.3)	55.8 (13.8)	57.8 (7.2)	55.5 (11.3)	58.2 (7.9)	58.5 (12.9)
Male	90%	70%	57%	57%	60%	83%	75%	70%	56%	40%
Small Tear	0	20%	0	0	0	0	0	0	0	30%
Medium Tear	60%	30%	43%	43%	40%	50%	38%	70%	22%	10%
Large Tear	40%	20%	43%	43%	20%	33%	25%	30%	44%	20%
Massive Tear	0	30%	14%	14%	40%	17%	38%	0	33%	40%
SANE rating Mean (SD)	88.5 (6.7)	82.8 (21.3)	91.4 (12.5)	94.3 (6.7)	93.0 (13.0)	78.3 (16.0)	78.6 (21.8)	89.5 (7.6)	91.4 (11.0)	92.0 (6.8)
Transfer bias	0	0	30%	30%	50%	40%	20%	0	10%	0

Table 1: Demographic variables, SANE rating, and transfer bias by block number (consecutive blocks of 10 cases). n represents number of cases per block; SD represents standard deviation.

SANE Rating	n	Percentage
100	21/82	26%
80 to 99	48/22	58%
<80	13/82	16%

Table 2: Number (n) and percentage of patients having SANE ratings of 100, SANE ratings from 80 to 99, and SANE ratings of less than 80.

Full article and references also available online at www.isakos.com

TENNIS ELBOW



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The lateral epicondylitis of the elbow is a very common injury in the orthopedic sports medicine field. Although the pathoanatomy of what is

now usually referred to as tennis elbow is unclear, most agree that it commonly involves repetitive overuse of the common wrist extensors at their origin on the lateral epicondyle.

SPORT SPECIFIC ETIOLOGY

Etiology in Sports Field

The majority of tennis elbow sports active patients with tennis elbow play a racquet sport, and most of them are amateur tennis players. The most frequent reason for developing the symptoms is an inappropriate technique of tennis strokes, mainly for the one-handed backhand stroke. Kelly et al reported a different muscle contraction pattern for tennis players who had a tennis elbow injury compared with those who did not suffer from that condition. They pointed out that the players whom were examined with painful tennis elbow presented the pain activity with a delayed activation pattern of their wrist due to the extensor muscles during the one-handed backhand stroke. This delay causes a higher amount of vibration that is transmitted to the forearm and elbow during the contact of the ball within the racquet strings, thus exposing the athlete to the risk of injury. Usually in those athletes the elbow is flexed during the contact of the ball within the racquet, and because of that the insertion of the extensor carpi radialis brevis (ECRB) has to support a high amount of stress during the backhand stroke.

CLINICAL AND PATHOLOGICAL FINDINGS

The majority of tennis elbow patients continue to play tennis with mild symptoms and use various modalities after the first episode of treatment to manage the pain. The time between the onset of first pain at the elbow and the clinical consultation can vary from months to years. For this reason, we treat mostly chronic cases at the office. During the clinical assessment it is important to ask specific questions about tennis topics: the type of racquet that the athlete uses; whether or not, if he/she had changed the racquet before the beginning of the pain; the tension of the strings; the racquet weight; the type of backhand stroke (with one or two hands); and also if pain is felt during a specific type of stroke (serve, backhand, forehand or volley). Also we should usually ask about pain during activities of daily living. A typical pain is reported at the lateral aspect of the elbow, directly at the

lateral epicondyle. The Maudsley test is usually positive, and in some cases the strength of the forearm muscles (measured by the Jamar® dynamometer) is decreased.

RADIOLOGY ASSESSMENT

Radiographs of the elbow are usually normal, unless there is calcification present. A good ultrasound examination is usually sufficient to determine the injury. In some chronic cases, an MRI is obtained to assess the elbow joint (FIGURE 1), because in some chronic cases the pain may be associated with internal cartilage damage. In my opinion that's the only justification for the high cost of this exam.

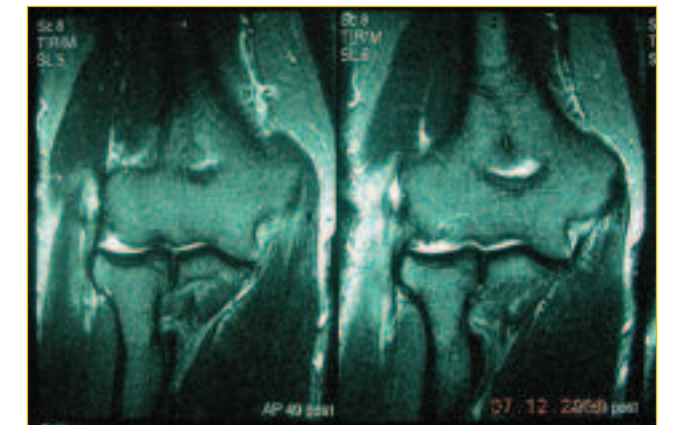


Figure 1: MRI of the right elbow of an amateur tennis player showing a tendon degeneration of the ERBC with a rupture.

TREATMENT

Non surgical modalities such as activity modification, coaching of better techniques related to correct tennis strokes, physical therapy, and corticosteroid injections are reported to have between 75% to 90% success rates. Despite some good papers in the literature, my personal experience is that the corticoid injections just delay the surgical procedure in the active tennis players, because they will only relieve the pain for 2 or 3 months after the injections. There are many research papers which discuss this topic. We know that the corticoid injections cause the death of the tenocytes present within the tendon.

TENNIS ELBOW *(cont.)*

In resistant cases, open surgical debridement of the extensor carpi radialis brevis (ECRB) has been the gold standard of treatment. The surgery has to focus on the resection of the degenerative tissue present in the ECRB tendon—we do not have to release the tendon insertion (FIGURE 2).

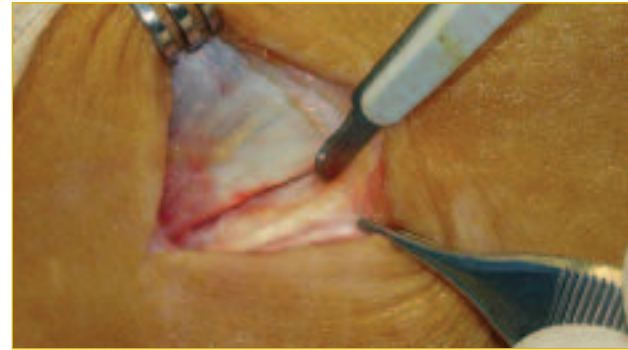


Figure 2: Degeneration of the tendon in a surgical case (tip of the knife).

Many authors discuss the surgical technique, and our preference is to use an open procedure for the tendinosis resection. Other techniques have been reported in the past such as the percutaneous surgery reported by Dunkow et al in 2004, when they compared their procedure with the open surgery. Other surgeons are now performing the arthroscopic resection of the lesion, and some have reported good results with this procedure. These authors agree that the injury involves a lateral capsule disorder also and, not just the tendon disease. The problem with those papers is that the patient population consists of non-tennis players, and the results may not be extended to the sports practice.

Histologic examination of the pathologic tissue demonstrates angiofibroblastic dysplasia, which consists of immature collagen and a disorganized array of fibroblasts and infiltrating vessels with no evidence of inflammation. When we exam the microscopic aspects of the resected tendon after the surgery, currently we also see a mixed degeneration of the tendon. We consider this to be the reason why the patients are not improved earlier in disease degenerative process.

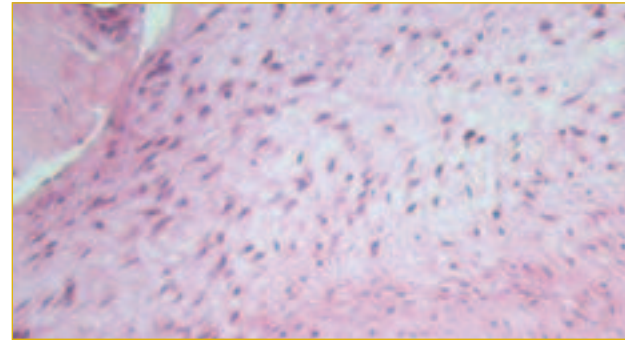


Figure 3: Microscopic exam of a surgical resected tendon showing the typical myxoid appearance with fibrotic tissue.

ADVANCES IN THE TREATMENT

Recently, alternative modalities such as ultrasound, laser treatment, botulinum injection, acupuncture, extra-corporeal shockwave therapy and autologous blood injection for resistant lateral epicondylitis have been investigated. A paper recently published by Mishra et al reported a good result in a cohort study (level 2 of evidence) among patients that were injected in the painful site with autologous platelet derived growth factors. We are using this method in our clinic, but at this stage now we do not have a sufficient number of patients with an adequate follow-up to report. The results so far are encouraging and we are continuing this study of this method in non-surgical and surgical patients, to improve the healing and to decrease the time away from tennis.

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AN ANALYSIS OF THE QUALITY OF CARTILAGE REPAIR STUDIES — An Update



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Note to the reader: This article is an update to a previously published article, containing previously published results as well as new results. The reader is referred to the previously published paper for the details on materials and methods and for detailed discussion of older results.

INTRODUCTION

Surgical treatment for cartilage injury is of major interest to orthopaedic surgeons because most lesions of articular cartilage do not heal spontaneously and may predispose the joint to the subsequent development of secondary osteoarthritis. In a series of 993 knee arthroscopies performed because of pain, substantial cartilage lesions considered suitable for surgical treatment were detected in 6% of the patients. Treatment for articular cartilage injuries includes the microfracture technique, autologous periosteal transplantation, autologous osteochondral transplantation, autologous chondrocyte implantation with and without the assistance of various three dimensional matrices. In addition techniques utilizing allografts exist, though not widely used and therefore not a subject in this review. Much controversy is related the best treatment option. Numerous published articles, in which the above treatment options were used, have described good or excellent results for a majority of patients, yet several authors have pointed out methodological weaknesses in the published studies.

The purpose of this and the previously published article was to determine whether the optimistic reports in the literature are supported by sound methodological quality in the studies. Our main hypothesis was that the majority of the studies have methodological limitations that may limit the value of the reported results. We addressed the methodological limitations by calculation a modified Coleman Methodology Score (CMS) and a level-of-evidence rating. In the previously published article we correlated this to the reported results to test whether studies of lesser methodological quality reported higher rates of success. In this article we have solely looked at the methodological quality of new studies.

MATERIALS AND METHODS

We refer the reader to the previously published paper in The Journal of Bone and Joint Surgery American Volume, October, 2005 p. 2232 for a detailed materials and methods description. We used the exact same search strategy and selection criteria for this update and searched the Medline In-process and other

Non-Indexed Citations, EMBASE and CINAHL using OVID. We also searched the Cochrane Central Register of Controlled Trials. All searches were performed and finished on April 4th, 2006.

We reviewed 158 abstracts of which eighteen filled the selection criteria. SPSS software (version 13.0.0; SPSS, Chicago, Illinois) was used to analyze the data.

RESULTS

In our first article on this topic we included sixty-one studies reporting on 3987 operations of which 260 were from randomized controlled trials. The average CMS was 43.5 (95% C.I., 40.3 to 46.7) with especially low scores in five categories: type of study, description of postoperative rehabilitation, outcome criteria, outcome assessment, and subject selection process. At that time we found thirty-five retrospective studies, twenty-two prospective studies and only four randomised controlled trials.

In this update eighteen studies reported on 1003 operations (median 46) of which 195 were from randomised controlled trials and 116 from non-randomised controlled trials. The average CMS was 56.3 (95% C.I., 49.3 to 63.2), which was a statistical significant improvement ($p < 0.0001$). However, methodological limitations were still frequently found in the above-mentioned categories. The average CMS for each criterion and the total CMS are given in Table I. The distribution of the studies with regard to type of treatment, type of study, and level-of-evidence rating is given in Table II.

In our first review we analyzed the outcome results with respect to type of therapy, but could not find any significant differences between the reported outcomes (forty-seven studies; $p = 0.11$). Indeed, large variations in reported outcome were demonstrated within each treatment modality (Fig. 1). We found that the CMS correlated positively with the level-of-evidence rating ($r = 0.668$, $p < 0.0001$), but the variations within each level were large. In this update we find the same trend (Fig. 2), but find an even larger variations in the level-IV evidence.

Also in the first article we identified several double publications, in addition to one article describing a group of patients that may have been a subgroup of the patients included in a randomized trial. We found no double publications in the update.

Interestingly we noticed that in one article patients received identical surgical treatment but were divided into two groups with different rehabilitation protocols and another article reported on a new retrograde technique for treating tibial cartilage defects. One article also reported on autologous chondrocyte implantation in combination with autologous osteochondral transplantation and several papers on various types of matrix-assisted chondrocyte transplantation alone or compared to other treatments.

AN ANALYSIS OF THE QUALITY OF CARTILAGE REPAIR STUDIES — *An Update* (cont.)

DISCUSSION

We refer the reader to the original article for a detailed discussion on methods and previous results. This discussion only takes into account findings from the newly included articles.

Research on the surgical treatment of cartilage injury has been extensive over the last two decades, and although numerous articles have been published reporting mostly good to excellent results, the methodology of the studies in general has been questioned.

We previously showed that the majority of papers in this area had methodological deficiencies. This is still the main finding even though it is encouraging to find a significantly improved CMS.

A total of 6 randomized controlled trials have been performed in cartilage treatment comparing autologous chondrocyte implantation and autologous osteochondral transplantation (mosaicplasty) (three studies), autologous chondrocyte implantation and microfracture, autologous osteochondral transplantation (mosaicplasty) and microfracture, and autologous chondrocyte implantation and matrix-assisted autologous chondrocyte implantation. The CMS varied between 56 and 79. Four of these found no significant difference between treatments. One well performed study (CMS = 79) found arthroscopic autologous osteochondral transplantation to be superior to microfracture. Another study found autologous chondrocyte implantation to be superior to autologous osteochondral transplantation (mosaicplasty), but were of lesser methodological quality (CMS = 56).

As of today no treatment modality has emerged clearly superior to other modalities and it seems that several surgical methods provide a comparable good-to-excellent functional outcome at least in the one to five year postoperative period. More well-designed and well-performed randomized controlled trials are needed to determine whether this is truly the case.

The increased focus on methodology in major journals by marking original articles with a level-of-evidence is highly appreciated. However, we would like to emphasize the fact that randomized controlled trials can have serious design flaws (i.e. not using independent reviewers, no statistical power analysis, not using an adequate randomization procedure, not accounting for eligible subjects not included in study), and therefore be rated as level-of-evidence II. We would also like to draw the reader's attention to the fact that several well-performed case series (level-IV evidence) score very well on the CMS. These studies largely take into consideration multiple aspects of good methodological quality such as independent investigator, sufficient number of patients, well-described rehabilitation protocol, validated

outcome measures and so forth, and are mainly lacking in not having a control group. We therefore recommend the reader to not entirely dismiss articles marked level-IV evidence, yet themselves assess the methodological quality of the paper when interpreting the results (for example using a grading system like the CMS).

On the basis of our findings in this update we maintain the recommendation to readers of cartilage studies to be cautious when interpreting result. In our first article we proposed the following guidelines for future studies, and although methodology has improved we find it worthwhile to repeat the guidelines here:

1. Studies should be prospective with a clearly defined hypothesis and one clearly defined primary end point. They should be randomized controlled trials with an adequate randomization procedure and power analysis for the primary end point. Secondary end point should only be used a supportive evidence to the primary hypothesis.
2. Patient inclusion and exclusion criteria should be clearly established and reported. The recruitment rate should be reported, and attempts should be made to account for eligible patients who are not included and those who are lost follow-up.
3. The outcome measure should be validated for use on patients with cartilage injuries.
4. Outcome assessment should be made by an independent investigator. The assessment should be in a written form and ideally be completed by the patient without investigator assistance.
5. The timing of the outcome assessment should be clearly stated. Results from various time-points after surgery should not be reported as one outcome. Assessments should be both clinical and functional. The minimum duration of follow-up should be more than twenty-four months.
6. Detailed rehabilitation protocols should be established and reported. Attempts should be made to monitor compliance. The protocols should be applied in a standardized manner to both patient cohorts.

Full article and references also available online at www.isakos.com

DISTRICT HOSPITAL of TRAUMATOLOGY

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Regional Centre of Knee Surgery, Arthroscopy and Sport Traumatology organizes yearly elementary courses in knee and shoulder diseases and injuries as well as sport traumatology for specializing doctors. It also organizes specialist courses in knee surgery including arthroscopy, meniscus and cartilage surgery, knee, shoulder and ankle joint arthroplasty and shoulder instability.

In the last three years the following courses were organized:

- knee surgery;
- shoulder arthroscopy;
- knee arthroplasty;
- traumatology in sport medicine;
- primary, total knee arthroplasty;
- unicompartmental knee arthroplasty;
- shoulder arthroplasty;
- ankle arthroplasty;
- revision knee arthroplasty;
- shoulder instability;
- numerous conferences (two or three days long).

Regional Centre of Knee Surgery, Arthroscopy and Sport Traumatology acts as a ward of II Independent Voievod Traumatology Hospital in Piekary Slaskie.

The hospital and its individual wards specialising in treatment of injuries and diseases relating to motion organs serve the whole Silesian macroregion as well as patients from other regions of Poland. Apart from the ward head and his deputy there are eight specialising doctors, six of whom have the doctor's degree and one with habilitation.



The Centre carries on:

- consultation and out-patients' treatment;
- surgeries of knee, shoulder and ankle joints (about 200 monthly);
- internal and external trainings, courses, conferences and show operations.

Apart from organized courses the staff tries to train themselves by participating in conferences and courses (ESSKA, ISAKOS). The doctors in the Centre have at their disposal two state-of-the-art surgical rooms. The Centre disposes of 50 beds in rooms for one to five patients equipped with bathrooms. Patients can also make use of fully equipped rehabilitation ward or the care of qualified rehabilitant in the patients' rooms.

In the years 2001–2005 about 250 doctors participated in the courses organized by the Centre, 40 doctors took part in trainings, 100 in conferences and about 50 were present for the show surgeries. The participants comprised specialising or already specialised doctors from Silesia, the whole of Poland as well as from Ukraine, Byelorussia, Lithuania, Latvia, Hungary and Austria.



ISAKOS APPROVED COURSES

8TH TURKISH SPORTS TRAUMATOLOGY, ARTHROSCOPY AND KNEE SURGERY CONGRESS

October 10–14, 2006, Kuşadası, Turkey
Bülent Alparslan MD and Halit Pinar MD



The 8th Congress of the Turkish Society of Sports Traumatology, Arthroscopy and Knee Surgery was held on October 10–14, 2006 in Kuşadası. The congress site was located one hour from Izmir and next to Ephesus, which is known to be the commercial, religious and social center of antiquity and one of the highlights of any visit to Turkey. The famous Celsus Library hosted the Welcome Cocktail.

The Congress takes place every two years and rotates between the four chapters: Istanbul, Antalya, Ankara and Izmir. More than 500 colleagues participated in the meeting where all subjects of sports trauma, arthroscopy and knee surgery were addressed.

Philippe Lobenhoffer, MD (Germany) and Prof. Dr. Ahmet Sebik (Turkey) were the Honorary Presidents. In addition to the leading Turkish orthopaedic surgeons, outstanding international guest speakers were invited by the Congress President Prof. Dr. Bülent Alparslan, the secretary Prof. Dr. Halit Pinar and the local organizing committee: P. Lobenhoffer, R. Becker, W. Nebelung, J. Agneskirchner, Ü. Tanker, M. Yücel, E. Başad, K. Shino, K. Nakata, N. Nakamura, Y. Toritsuka, R. Verdonk, P. Neyret, C. Evans, J. Nyland, and C. Ackroyd.

The scientific program was comprised of 27 lectures, 14 symposia, 2 debates, and 12 instructional courses. The Meeting also included the presentation of 63 free papers and 51 posters.

On the 2nd day of the congress, a half-day had been set aside for the symposium organized by the German Speaking Countries Arthroscopy Working Group (AGA). It was an outstanding performance and great success. Thanks to President P. Lobenhoffer and his German colleagues W. Nebelung, R. Becker and J. Agneskirchner.

At the General Assembly Meeting, the new Executive Committee members of The Turkish Society of Sports Traumatology, Arthroscopy and Knee Surgery were elected. Prof. Dr. Ömer Taşer took over the presidency from Prof. Dr. Bülent Alparslan. The next congress will be held 2008 in Istanbul (Congress President: Prof. Dr. Işık Akgün and Secretary: Prof. Dr. Mehmet Aşık).

ISAKOS WORKSHOPS 2006

IASCON 2006

October 13–15, 2006
Calcutta, West Bengal, India
www.iascon2006.com

Program Chairs: Jaap Willems and Ramon Cugat

On October 13–15, 2006, the Indian Arthroscopy Society (IAS) held its Cadaveric Lab and Annual Meeting in Calcutta and was an ISAKOS sponsored workshop. The international speakers included Jaap Willems (Netherlands), Felix Savoie (USA) and Ramon Cugat (Spain), as well as several local speakers from India.

The IAS, with more than 800 members, is one of the largest arthroscopy oriented societies in South East Asia. Its annual cadaveric workshop and meeting aims to create awareness among general orthopaedic surgeons in this part of the world without expanding indications and technicalities of arthroscopy, thus initiating them in to this specialty. It also aims to provide a common platform for already practicing surgeons to exchange their experiences and to interact with faculty from around the world. This will help each delegate attending the course to learn about new innovations and to upgrade their surgical skills.

The National Orthopaedic Surgeons Society arranged for an arthroscopic workshop and live arthroscopic surgery in Dhaka, Bangladesh following the IAS Annual Meeting. The faculty included Montse Garcia (Spain) and Ramon Cugat (Spain).



ISAKOS WORKSHOPS 2006

CURRENT CONCEPTS IN SPORTS INJURIES

The Great Wall Sheraton Hotel
Beijing, China
Saturday, October 28, 2006

Sponsored by:

The International Society of Arthroscopy, Knee Surgery and Orthopaedic Sports Medicine (ISAKOS), The Chinese Orthopedic Association (COA) and The Chinese Sports Medicine Association (CASM)

Course Chairs:

Changlong Yu, Freddie Fu, Yingfang Ao

Following the ISAKOS Global Leadership Retreat in Beijing, ISAKOS sponsored the Current Concepts in Sports Injuries meeting. This was an outstanding opportunity as China, a country with a population of 1.3 billion including 10 cities having a population of over 10 million each, and a rich history of Eastern medicine, looks to expand their Sports Medicine knowledge and expertise with some Western Influence.

With the Olympics 2 years away, ISAKOS partnered with Peking University to host a current concepts meeting in sports injuries in Beijing, China on October 28, 2006. Co-chaired by Freddie Fu, Changlong Yu and Yingfang Ao, 16 ISAKOS members representing 10 countries and 2 Orthopaedic Surgeons from China put together an all day, state of the art program to over 300 Chinese physician participants. The meeting, held at the Great Wall Sheraton Hotel in Beijing, attracted physicians and surgeons from all over China and covered a variety of topics focusing on the knee and shoulder, as well as the elbow, hip, tendonopathy and rehabilitation. The presentations were translated into Mandarin Chinese and distributed in a syllabus at the meeting. Several of the lectures generated productive and thought provoking discussion. This meeting served as an excellent foundation for long term relationships and partnerships with ISAKOS. Following the meeting, the faculty dinner was held at the Chinese State Guests Hotel, hosted by Drs. Yu and Ao. This was an excellent and famous venue with a delicious traditional Chinese meal.

We would like to thank our excellent hosts from China and particularly Peking University, Dr. Yu and Dr. Ao, as well as our Global Leadership partners from industry.

MEXICO CITY

November 16–17, 2006
Dr. Arturo Almazan
Cirugia Artroscopica y Lesiones Deportivas
Tuxpan 54–809. Mexico D.F.
Tel. 55646000 y 55642870
arturo@mirodilla.com
www.mirodilla.com



A residents and fellows course took place in Mexico City on November 16–17, 2006 and was a huge success. ISAKOS sponsored this workshop where 12 residents and fellows from several hospitals in Mexico City participated. Both knee and shoulder procedures were demonstrated on cadaveric specimens.



The participating companies did an excellent job and provided plenty of implants for the residents and fellows to practice with. This allowed the residents and fellows the opportunity to experiment with different systems and implants.

Getting To and Staying in Florence, Italy

Flying to Florence

Congress attendees can fly into the Florence International Airport "Amerigo Vespucci" which is located only four (4) kilometers from the city center. The Florence Airport provides direct flights to the main European cities, which makes it easy to reach any final destination in the world. For more information on the Florence Airport, please visit <http://www.aeroporto.firenze.it>.

It is also possible to fly into the Pisa International Airport "Galileo Galilei," which is located fifty (50) minutes by train into the Florence Central Railway Station. For more information on the Pisa Airport, please visit <http://www.pisa-airport.com>.

Ground Transportation

The Florence Central Railway Station (Santa Maria Novella) is centrally located and is within walking distance to the Congress facilities and many hotels. Direct Eurostar trains are available from Florence to Rome, Milan and Naples. For more information on train schedules and ticket reservations, please visit www.trenitalia.com/home/en/index.html.

Local busses (ATAF) and white RADIO TAXI cars are also available for convenient transportation around Florence.

Hotel Accommodations

ISAKOS will offer special congress rates at a number of hotels in Florence. Hotel reservations can be made by visiting www.oic.it/isakos2007. Room Reservation Deadline: **March 27, 2007.**

Welcome Reception at the Fortezza da Basso

ISAKOS welcomes all congress attendees and their guests to the ISAKOS Welcome Reception. This grand, festive affair is a highlight of the congress, offering music, hors d'oeuvres and cocktails to all congress attendees and their families.

Attendance is included with the cost of registration. Dress is business casual.

Date: Sunday, May 27
Time: 18:30–21:00
Cost: Included in registration. Guests are welcome.
Location: Fortezza da Basso

Lunchtime Breakout Sessions

A lunchtime series of hands-on laboratories and lectures will allow attendees to gain hands-on experience while learning the latest innovations in research and techniques.

The sessions will be located at the Spadolini Pavilion of the Fortezza da Basso and will last 90 minutes on Sunday, Monday and Wednesday. Topics are likely to include meniscus repair, ACL and PCL reconstruction, shoulder stabilization, rotator cuff repair and Alex shoulder model workshops.

The sessions are free of charge to all congress registrants. Attendance will be awarded on a first-come, first-served basis.

Dates: Sunday, Monday and Wednesday
Time: 12:00–13:30
Cost: Included in Registration

Day Tours

Sunday, May 27, 2007

Guided Tour of Siena and S. Gimignano (full day tour by bus)

Monday, May 28, 2007 PM

Guided Tour of Florence (half day walking tour)

Tuesday, May 29, 2007

H. Chianti, Smalltowns, Castles and Wine Tasting (full day tour by bus)

Wednesday, May 30, 2007

Guided tour of Lucca (full day tour by bus)

Thursday, May 31, 2007 am

Michelangelo tour (half day walking tour)

For Day Tour descriptions, pricing and registration visit www.oic.it/ISAKOS2007

Spouse Program

Enjoy the ISAKOS Congress as a registered spouse for the week in Florence. Spouse Program registration fees are \$40 for the spouse daily breakfast program at the Fortezza da Basso and spouse directory. See the ISAKOS Congress Registration Form to register.

Saturday, May 26 14:00–17:00 Registration Open

Sunday, May 27 07:30–09:30 Morning Coffee
Begin your day with coffee and assorted pastries with other spouses in the Spouse Lounge at the Fortezza da Basso.

18:30–21:00 Welcome Reception
This grand and festive affair, one of the many highlights of the congress, offers music, hors d'oeuvres and cocktails to all congress attendees and their guests at no additional cost. Dress is business casual.

Monday, May 28 07:30–09:30 Morning Coffee
Begin your day with coffee and assorted pastries with other spouses in the Spouse Lounge at the Fortezza da Basso.

Tuesday, May 29 07:30–09:30 Morning Coffee
Begin your day with coffee and assorted pastries with other spouses in the Spouse Lounge at the Fortezza da Basso.

Wednesday, May 30 07:30–09:30 Morning Coffee
Begin your day with coffee and assorted pastries with other spouses in the Spouse Lounge at the Fortezza da Basso.

Thursday, May 31 07:30–09:30 Morning Coffee
Begin your day with coffee and assorted pastries with other spouses in the Spouse Lounge at the Fortezza da Basso.

ENJOY THE FIVE-DAY ISAKOS MEETING ADVANTAGE:

- Greater amount of continuing medical education (CME) credits
- More time to network with world leaders in your specialty
- Greater exposure to numerous papers, posters, courses and presentations
- Five days to combine work and leisure
- A better value for your travel time and money!

SPOUSE PROGRAM HIGHLIGHT LECTURE

Monday, May 28, 2007 at 8:00 am

Marco Cianchi, Art History Professor at the Academy of Fine Arts in Florence, will present a lecture on the history of Florentine culture for all registrants of the ISAKOS Congress Spouse Program. Marco will review some of the most important works of art and the principal Renaissance artists (Botticelli, Leonardo da Vinci, Michelangelo) that made the fame of the city universal.

Also navigators (Amerigo Vespucci), politicians (Niccolò Machiavelli) and scientists (Galileo Galilei) will be featured in order to complete the picture of a civilization that contributed some of the best culture to the western world.

Professor Cianchi wrote extensively on the Renaissance and Leonardo da Vinci (machines, anatomical studies, etc). His other fields of interest are Modern and Contemporary Art.



Live Surgical DEMONSTRATIONS

ISAKOS is offering a series of live surgical demonstrations on cadavers, free to all attendees. All demonstrations will take place in the Fortezza da Basso.

Sunday, May 27

14:00 **General Session Room**
Novel Double Tunnel Anatomical ACL Reconstruction
 Matteo Denti, MD (Italy) and Piero Volpi, MD (Italy)
 Sponsored by DePuy Mitek

15:30 **ROOM 101**
Advanced Solutions In Anatomic ACL Reconstruction
 Pascal Christel, MD, PhD (France), Freddie H. Fu, MD (USA), and Darren Johnson, MD (USA)
 Sponsored by Smith & Nephew
 Side-by-side comparison of multiple-tunnel anatomic ACL reconstruction techniques.

Monday, May 28

11:00 **ROOM 102**
Knotless Slap/Bankart Repair and Arthroscopic Rotator Cuff Repair
 John Uribe, MD (USA)
 Sponsored by ArthroCare
 See the latest technology in arthroscopic, knotless rotator cuff, Bankart and SLAP repair.

14:00 **ROOM 101**
Chondral Defect Repair Using Synthetic Resorbable Osteochondral Plugs
 Christoph Erggelet, MD, PhD (Germany) and Nicholas Sgaglione, MD (USA)
 Sponsored by Smith & Nephew
 Focal chondral lesions will be repaired with a novel synthetic scaffold to achieve surface and tissue restoration of the cartilage and bone.

Tuesday, May 29

10:00 **General Session Room**
Two Tunnel PCL Reconstruction
 Greg Fanelli, MD (USA)
 Sponsored by Arthrotek
 Combined ACL/PCL reconstruction using a new biological ingrowth fixation system.

11:30 **ROOM 102**
Arthroscopic Rotator Cuff Footprint Repair Using Non-Knot Tying Suture Anchors
 James Esch, MD (USA) and Michael Terry, MD (USA)
 Sponsored by Smith & Nephew
 Surgeons will repair a massive RC tear utilizing standard method with a non-knot tying threaded anchor system as well as a new method to achieve a footprint repair.

12:00 **ROOM 102**
Current Concepts in Arthroscopic RC Repair Using the Dual Row Triangle Repair Method
 Sumant "Butch" Krishnan, MD (USA)
 Sponsored by DePuy Mitek
 Surgeons will learn the most current indications and techniques for arthroscopic dual-row rotator cuff repair. In addition to basic principles of rotator cuff repair in general, surgeons will understand the nuances of portal placement/access, suture management, anchor placement, and knot security. The techniques demonstrated have been biomechanically confirmed to restore both the native footprint of the rotator cuff as well as the tendon security to bone to improve healing.

Wednesday, May 30

11:15 **ROOM 101**
MIS 4-in-1 Surgical Approach
 Paolo Aglietti, MD (Italy)
 Sponsored by Zimmer
 Zimmer® MIS™ Multi-Reference® 4-in-1 Surgical Technique utilizing the Gender Solutions™ NexGen® LPS-Flex Total Knee System.

14:00 **ROOM 102**
Combined ACL RetroConstruction and High Tibial Osteotomy
 Giancarlo Puddu, MD (Italy) and Annunziato Amendola, MD (USA)
 Sponsored by Arthrex
 High Tibial Osteotomy and ACL Reconstruction is a common combination. The demonstration includes: new ACL tunnel placement technique in respect to HTO planing and performance.

15:00 **ROOM 101**
Advances in Hip Labral Repair Using Osteoconductive Suture Anchors
 Marc Philippon, MD (USA) and Michael Leunig, MD (Switzerland)
 Sponsored by Smith & Nephew
 Surgeons will demonstrate arthroscopic treatment for femoro-acetabular impingement and repair of the hip labrum.

www.isakos.com

ISAKOS Masters Course

ADVANCES IN KNEE ARTHROPLASTY
Saturday, May 26, 2007 • Florence, Italy
Fortezza da Basso • Room 201

08:00	Registration and Breakfast	
8:45	First Session Moderator: Michael Kelly	Paolo Aglietti The John Insall Legacy
8:55 9:05 9:15 9:25 9:35 9:45 9:55	Second Session—High Performance Total Knee Moderators: Daniel Berry, Jan Victor, J. David Blaha, Leo Whiteside, Richard Komistek, Michael Ries	Johan Bellemans and Kelly Vince High Performance Guided Motion Medial Pivot CR Cementless Kinematics in Mobile and Fixed TKA New Bearing Materials
10:25	Coffee Break	
11:00 11:10 11:20 11:30 11:40 11:50 12:00	Third Session—Surgical Technique: MIS & Navigation Moderators: Peter Bonutti, Paolo Aglietti, Jean-Yves Jenny, Johan Bellemans, John Bartlett, Chitranjan Ranawat	Francesco Benazzo and Richard Scott MIS Rotational Positioning Accuracy with Navigation Navigation and Balancing Soft Tissue Balancing Overview 2007
12:30	Lunch	
13:30 13:40 13:50 14:00 14:10 14:20 14:30	Fourth Session—Partial Knee Replacement Moderators: Christopher Dodd, Philippe Neyret, Jean-Noel Argenson, Sergio Romagnoli, Jess Lonner, Richard Scott	Dieter Kohn and Mark Pagnano Mobile UNI Lateral UNI High Flex UNI Bicompartmental UNI Patellofemoral Arthroplasty Overview 2007
15:00	Coffee Break	
15:30 15:40 15:50 16:00 16:10 16:20 16:30	Fifth Session—Revision Update Moderators: Michael Kelly, Mark Pagnano, Edward Keating, Kelly Vince, Dieter Kohn, Nadim Hallab	John Bartlett and Leo Whiteside Stem Extensions Bone Loss and TM Recurvatum Instability Stiff TKA Metal Sensitivity
17:00	Adjourn	

REGISTER

REGISTER ONLINE FOR THE PRE-COURSE AT WWW.ISAKOS.COM

Registration Fees are US\$250 for Non-ISAKOS members and US\$200 for ISAKOS members. CME credits will be offered.

WHO SHOULD ATTEND THE 2007 ISAKOS CONGRESS?

- Any health care practitioner, who specializes in arthroscopy, knee surgery or orthopaedic sports medicine, including:
- Orthopaedic surgeons
 - Orthopaedic physician assistants
 - Physical therapists
 - Orthopaedic residents
 - Orthopaedic fellows

ISAKOS offers reduced registration fees for residents, fellows and allied health care professionals.



UPCOMING ISAKOS APPROVED COURSES



III INTERNATIONAL HIP ARTHROSCOPY MEETING

IEP Hospital Sirio-Libanés
Sao Paulo, Brazil
March 1–3, 2007

For further information, please contact:
Giancarlo Polesello, MD, PhD
Tel: +55 11 50551528
Fax: +55 11 21146090
giancarlopolesello@hotmail.com
gepe@terra.com.br

THE 23RD INTERNATIONAL JERUSALEM SYMPOSIUM ON SPORTS MEDICINE

Jerusalem, Israel
March 14–15, 2007

For further information, please contact:
Gideon Mann, MD
drmann@regin-med.co.il

29TH FRESH CADAVER KNEE ARTHROSCOPY WORKSHOP

Yonsei University Hospital
Seoul, Korea
March 31, 2007

For further information, please contact:
Sung-Jae Kim, MD
Tel: +82 2 22285679
Fax: +82 2 3636248
www.severanscopy.com
sungjaekim@yumc.yonsei.ac.kr

16TH FRESH CADAVER KNEE ARTHROSCOPY COURSE

Sheraton Hotel
Antalya, Turkey
April 5–7, 2007

For further information, please contact:
A. Merter Ozenci, MD
Tel: +90 242 2496171
Fax: +90 242 2274329
www.artroskop.org
merteroz@yahoo.com

30TH FRESH CADAVER KNEE ARTHROSCOPY WORKSHOP

Yonsei University Hospital
Seoul, Korea
April 7, 2007

For further information, please contact:
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Tel: +82 2 22285679
Fax: +82 2 3636248
www.severanscopy.com
sungjaekim@yumc.yonsei.ac.kr

A KNEE SUMMIT: FROM BIRTH TO DEATH

InterContinental Hotel and MBNA
Conference Center
Cleveland, OH, USA
April 11–14, 2007

For further information, please contact:
John A. Bergfeld, MD
Tel: +1 216 444 2618
Fax: +1 216 445 7362
bergfej@ccf.org

2ND CONGRESS OF THE GREEK ARTHROSCOPY SOCIETY

Zapio Megaro
Athens, Greece
June 14–16, 2007

For further information, please contact:
Michael Hantes, MD
Tel: +30 2410 689722
Fax: +30 2410 670107

16TH SEVERANCE ARTHROSCOPY LIVE SURGERY AND SYMPOSIUM

Severance Hospital
Seoul, Korea
June 23, 2007

For further information, please contact:
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Fax: +82 2 3636248
www.severanscopy.com
sungjaekim@yumc.yonsei.ac.kr

31ST FRESH CADAVER KNEE ARTHROSCOPY WORKSHOP

Yonsei University Hospital
Seoul, Korea
November 3, 2007

For further information, please contact:
Sung-Jae Kim, MD
Tel: +82 2 22285679
Fax: +82 2 3636248
www.severanscopy.com
sungjaekim@yumc.yonsei.ac.kr

32ND FRESH CADAVER KNEE ARTHROSCOPY WORKSHOP

Yonsei University Hospital
Seoul, Korea
November 10, 2007

For further information, please contact:
Sung-Jae Kim, MD
Tel: +82 2 22285679
Fax: +82 2 3636248
www.severanscopy.com
sungjaekim@yumc.yonsei.ac.kr

33RD FRESH CADAVER KNEE ARTHROSCOPY WORKSHOP

Yonsei University Hospital
Seoul, Korea
December 8, 2007

For further information, please contact:
Sung-Jae Kim, MD
Tel: +82 2 22285679
Fax: +82 2 3636248
www.severanscopy.com
sungjaekim@yumc.yonsei.ac.kr

34TH FRESH CADAVER KNEE ARTHROSCOPY WORKSHOP

Yonsei University Hospital
Seoul, Korea
December 15, 2007

For further information, please contact:
Sung-Jae Kim, MD
Tel: +82 2 22285679
Fax: +82 2 3636248
www.severanscopy.com
sungjaekim@yumc.yonsei.ac.kr



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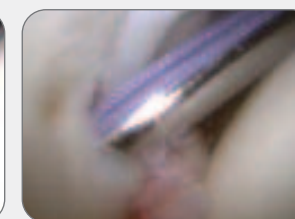
KINSA Anchor, knot included.

When performing shoulder instability repairs with the new KINSA Suture Anchor from Smith & Nephew Endoscopy, you control the amount of tension in the suture without driving the anchor deeper into the bone. This is possible because the KINSA Suture Anchor includes a preloaded anchor with a self-locking, sliding knot contained inside.

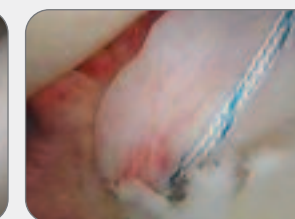
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BIOKNOTLESS[™] ANCHOR



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SMITH & NEPHEW
KINSA ANCHOR



This innovative product design not only saves time during the procedure but also leaves a single loop of suture around the tissue instead of a high knot stack in the joint. Discover the golden difference for yourself.

